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Gapping is always forward

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One of the recurring themes of Jan Koster's work on grammatical dependencies has been his elegant insight that they can all be reduced to the same format, what he calls the 'configurational matrix' (e.g. Koster 1987, 2003, 2004, 2009). Schematically, this looks as follows:

- (1) [_β ... α ... δ ...]

where α is the antecedent in the grammatical relation, δ is the dependent, and β is some minimal domain. This configurational matrix has four core properties:

- (2) a. α precedes δ
b. bi-uniqueness: one α for δ and one δ for α
c. bilocality (replaces c-command and locality)
d. recursion: both α and δ can be a β

In this squib I would like to discuss an apparent problem for (2a), what Koster (2009) terms the Principle of Natural Word Order (it is natural for an antecedent to precede a dependent since, plausibly, this makes computation/parsing simpler). I will focus on one particular grammatical relation that, like all others, should fit into (1), namely the relation between antecedent and gap in cases of gapping (see Neijt 1979; Koster 1998).

In VO languages like English gapping undisputedly is always forward, as illustrated by (3). In line with (2a), the antecedent has to precede the dependent gap. As (4) shows, the same holds for a language like Dutch, in which phrases seem to show a mixed direction of headedness at least on the surface, and the status of which as being OV or VO is debatable (see e.g. Koster 1975, 2008 vs. Zwart 2004). (Throughout I use ~~strikethrough~~ to indicate elided elements).

- (3) a. Jan likes Bach and Piet ~~likes~~ Ligeti.
b. *Jan ~~likes~~ Bach and Piet likes Ligeti.
- (4) a. Jan bewondert Bach en Piet ~~bewondert~~ Ligeti.
Jan admires Bach and Piet (admires) Ligeti
b. *Jan ~~bewondert~~ Bach en Piet bewondert Ligeti.

However, in the strict OV languages Japanese and Korean, the same grammatical relation of gapping appears to have an instantiation that goes backward, with the gap

occurring in the first conjunct and the antecedent verb apparently occurring in the second conjunct, as in the following Japanese example (from Sato 2008):

- (5) Takesi-ga zassi-o **katta** sosite Kaori-ga hon-o katta.
 Takesi-NOM magazine-ACC (bought) and Kaori-NOM book-ACC bought
 ‘Takesi bought a magazine and Kaori bought a book.’

This apparent violation of (2a) becomes even stranger when we consider a further phenomenon that can occur in cases of gapping, that of determiner sharing (cf. McCawley 1993; Lin 1999; Johnson 2000). In English (and Dutch) cases of gapping, some DPs in the second conjunct can omit their determiner, ‘sharing’ it with the determiner of the corresponding DP in the first conjunct:

- (6) Too many Irish setters are named Kelly and ~~too many~~ German shepherds are ~~named~~ Fritz.

Determiner sharing appears to rely on there being gapping in the conjunct in which the determiner is elided, at least in languages with forward gapping. Thus, (6) becomes ungrammatical if there is no verbal gapping in the second conjunct. For this reason, Ackema & Szendrői (2002) (henceforth A&S) analyse the phenomenon as an instance of ‘dependent gapping’, basing themselves on the analysis of gapping in Williams (1997). A&S argue that determiner sharing is crucially ‘dependent’ on ellipsis in two senses: it depends on there being a 0 head (in the sense of Williams) and it targets heads of dependents of this 0 head.

Citko (2007) notes that (apparent) backward gapping in languages like Japanese and Korean poses a problem for the type of analysis of determiner sharing proposed by A&S: although, as noted, the gap (the 0 head in A&S’s terms) here appears in the first rather than the second conjunct, determiner sharing still takes place in the second conjunct. Citko gives the following example from Korean to illustrate this:

- (7) Ku kay-tul-un Whiskas-lul **meknun**ta kuliko ~~ku~~ koyangi-tul-un
 the dog-PL-TOP Whiskas-ACC (eat) and (the) cat-PL-TOP
 Alpo-lul meknunta.
 Alpo-ACC eat
 ‘The dogs eat Whiskas and the cats eat Alpo.’

The same is true for Japanese (Satsuki Nakai, personal communication):

- (8) Sono shoonen-ga zassi-o **katta** sosite ~~sono~~ shoojo-ga
 that boy-NOM magazine-ACC (bought) and (that) girl-NOM
 hono-o katta.
 book-ACC bought
 ‘That boy bought a magazine and that girl bought a book.’

I will argue that the problem for (2a), and consequently also the problem for A&S's analysis of determiner sharing, is only apparent, because, despite appearances to the contrary, the actual ellipsis site is in the second conjunct in Japanese/Korean just as well as in English/Dutch.

One current analysis of apparent gapping in Japanese and Korean actually involves an empty verbal position in both conjuncts. This analysis is based on the hypothesis that the languages in question have string-vacuous rightward V-to-T, or perhaps V-to-T-to-C, movement (see for instance Otani & Whitman 1991 and Koizumi 2000). If this movement exists, it can apply across the board in cases of coordination, with the result that we get an apparent gapping construction: the verb has raised across the board to the T (or C) head on the right edge, and left a trace in the V head position in both conjuncts, as in (9).

- (9) $[_{TP} [_{VP} \dots t_V] \& [_{VP} \dots t_V] V-T]$

Although the analysis is not undisputed, it appears it can capture the relevant empirical data well; for discussion see Saito (1987), Koizumi (2000), Vermeulen (2008), among others. Since the conjuncts in (7) and (8) include their subjects, it may be that they are coordinated TPs, and the verb has raised across-the-board from T to C (the verb raises to the highest functional head at least in Japanese, cf. Kamada 2009). Alternatively, it may also be that Japanese and Korean lack a full-fledged TP altogether (compare for example Fukui 1995) so that we are dealing with coordinated VPs/vPs and verb movement to C instead. Just for concreteness sake I will adopt (9) here, that is, coordination of VPs/vPs and across-the-board verb movement from V/v to T. For the analysis of determiner sharing adopted here to work, all that is required is that the subject is in the specifier position of the projection whose head is gapped, which might be VP in some languages or TP in others; in cases of *wh*-movement it can even be CP (see A&S for further discussion).

An analysis like (9) gives us at least an empty verbal position in the second conjunct, but it cannot in itself constitute the solution to the puzzle under discussion. This is because the empty position is of the wrong type: it is the trace of a verb, not a 'proper' ellipsis gap, or a 0 head in the sense of Williams and A&S. Traces, whether they are actual copies or not, have all the same properties as their antecedents, at least where it regards their licensing capacities or the lack of them. So, whereas a 0 head can license dependent ellipsis of the heads of its dependents, a verbal trace is not expected to license this, simply because overt verbs do not do so either. This means we would not expect determiner sharing to be possible at all in Japanese/Korean, contrary to fact.

More strongly, if (9) is all there is to it, we would not expect the relevant sentences to behave like gapping constructions in any way, also in other respects. In general, apparent across-the-board movement phenomena behave very differently from proper deletion processes such as gapping, perhaps because 'across-the-board' phenomena,

but not deletion under identity, involve actual sharing of material between the two conjuncts; see e.g. De Vries (2005) on the difference between the two processes. That also accounts for the fact that across-the-board verb ‘movement’ in (9) does not itself violate (2a), and in general that such backward across-the-board phenomena are not subject to the configurational matrix in (2) at all, as they do not actually involve a grammatical dependency: the material we see spelled out on the right edge is present inside the conjuncts syntactically speaking (in this case we would be dealing with two TP conjuncts, in each of which there is string-vacuous V-to-T, sharing their T position). As it is not central to the point I want to make here, I will use the common description of the phenomenon in terms of ‘across-the-board movement’ below. What is central here, as noted, is that this phenomenon has quite different properties from gapping, whereas the Japanese/Korean construction does show properties of gapping.

Apart from the determiner sharing facts, most striking is that gapping is only possible if the remnant constituents in the conjunct with the gap are ‘disanaphoric’ (Williams 1997) to the corresponding constituents in the other conjunct, as illustrated by (10). Cases of leftward across-the-board movement do not impose a similar demand at all, as shown by (11a). The same is true for a ‘backward across-the-board’ construction like right-node-raising, see (11b).

- (10) a. John_i gave Mary_j a book and he_i gave her_j a pen as well.
 b. John_i gave Mary a book and he_{*i/j} **gave** Sue a pen.
 c. John gave Mary_i a book and Bill **gave** her_{*i/j} a pen.
- (11) a. Which cantatas has Emma_i sung – and has she_i subsequently recorded – ?
 b. Shostakovich_i admired –, and he_i therefore set out to write his own version of, the *Well-Tempered Clavier*.

But the Japanese gapping construction does have this hallmark of proper gapping, exactly like the English case in (10), as pointed out by Sato (2008). Sato therefore assumes the Japanese construction is just the mirror image of the English gapping construction, with the gap on the left, as apparently also assumed by Citko (see above). So we seem to come back to the original problems: can gapping really contravene (2a) and, if it does, how can determiner sharing be forward in that case?

The solution is to combine the two analyses. The occurrence of across-the-board verb movement does not mean that gapping proper cannot first have taken place as well. Let us therefore assume that gapping is an operation involving elision proper, not across-the-board movement, in Japanese and Korean as well. However, given that there is (string vacuous) rightward V-to-T (or V-to-T-to-C, or V-to-C, cf. above) movement in these languages, such movement can apply across-the-board in a coordination. Since this leaves an empty position in the V head of each conjunct, we cannot actually see which of these positions contains the 0 head induced by gapping. Therefore, in line

with (2a), it is perfectly feasible that it is actually the second conjunct that contains the gap, i.e. that gapping is forward as usual:

- (12) $[_{TP} [_{VP} \dots t_V] \& [_{VP} \dots 0] V-T]$

This accounts for the determiner sharing facts as well. Consider how. There are two possibilities. Either the 0 head must raise like any other verbal head, or it need not undergo verb raising because it lacks the features triggering this (whatever these are). In the first case, there is across-the-board rightward movement of what Williams (1997) terms the ‘bivalent’ (V,0) head of the coordination, and there is a trace of the 0 part of this in the right conjunct. In the second case only V in the left conjunct undergoes raising, and 0 in the right conjunct stays in situ (in apparent violation of the Coordinate Structure Constraint, but it is rather an open issue whether this applies to head movement, see for example Lin 1999 and Johnson 2000; alternatively, the verb we see spelled out on the right is actually present in the first conjunct syntactically, cf. above). Presumably the latter option is more promising, as the assumption that 0 heads need not raise can help account for certain data that indicate that the visible verb, or the visible shared determiner in cases of determiner sharing, does not reconstruct into the position of 0 for scope purposes, but must take wide scope over the entire coordination in certain cases (cf. Siegel 1984, 1987; Lin 1999; Johnson 2000; A&S). Be that as it may, for present purposes it does not matter which of these options is correct, because of the earlier noted fact that traces have the same licensing capacities as their antecedent. Thus, whether there is a 0 head in the second conjunct of a Japanese/Korean gapping construction or the trace of a 0 head, we expect this to license dependent ellipsis as per A&S’s analysis, and thus determiner ‘sharing’.

If it is correct that Japanese/Korean gapping is actually forward, that is, if it is correct to assume the 0 head is in the second rather than the first conjunct, it is crucially predicted that backward determiner sharing should not be possible in Japanese or Korean (just as it is not possible in English or Dutch). That would be unexpected for analyses that simply assume that the Japanese and Korean constructions are the mirror image of the English/Dutch one. It turns out that this prediction is correct, however. Thus, next to (7), (13) is not possible in Korean. Chung-hye Han (personal communication) notes that (13), without *ku* in the first conjunct, can only have a reading that is indicative of a lack of determiner sharing (namely ‘dogs in general eat Whiskas and those cats eat Alpo’). The determiner sharing reading, as given in the translation in (13), is impossible.

- (13) **ku* kay-tul-un Whiskas-lul meknunta kuliko ku
 (the) dog-PL-TOP Whiskas-ACC (eat) and the
 koyangi-tul-un Alpo-lul meknunta.
 cat-PL-TOP Alpo-ACC eat
 ‘Those dogs eat Whiskas and those cats eat Alpo.’

The same is true for Japanese. While forward determiner sharing is fine (see (8)), backward determiner sharing is not, as shown by (14) (Satsuki Nakai, personal communication).

- (14) *~~sono~~ shoonen-ga zasshi-o ~~katta~~ sosite sono shoojo-ga
 (that) boy-NOM magazine-ACC (bought) and that girl-NOM
 hono-o katta.
 book-ACC bought
 ‘That boy bought a magazine and that girl bought a book.’

Concluding, although we see the verb appearing on the right edge of the second conjunct in Japanese and Korean gapping constructions, it is actually this conjunct that contains the ‘gapping gap’, whereas the first conjunct contains the trace of the visible verb (or, better, the trace of the overt part of the bivalent (V,0) head of the coordination). Thus the Principle of Natural Word Order in (2a) can be maintained.

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